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"Identification of LMC X-ray Sources Using *ROSAT* HRI Images"

During AO1, eleven *ROSAT*-HRI images were obtained in fields centered on *Einstein* LMC point X-ray sources. From these data we derived excellent positions and intensities for the sources, allowing us to search for optical counterparts. In addition, the images contain almost an equal number of serendipitous sources, which we also studied. It is clear from a comparison of the *ROSAT* and *Einstein* data that many of LMC point sources in the LMC are variable.

To compliment the X-ray data, we have had several extremely successful optical observing runs at Cerro Tololo Interamerican Observatory in Chile to obtain photometry and spectra of optical candidates. Based on the *ROSAT* X-ray data and follow-up optical work we have been able to identify a number of the LMC X-ray sources. Their counterparts include quite a few cool foreground stars, several Seyfert galaxies, and three unusual hot stars in the LMC. The latter appear to be related to the Be-star X-ray sources known in the Galaxy. This project is still continuing using *ROSAT* data obtained during AO2 and AO3.

Publications Based on this Project

1992 *Bull.A.A.S.* 24, 1154 "Optical Identification of X-ray Sources in the LMC Using *ROSAT* Data", A.P. Cowley, P.C. Schmidtke, L. Frattare, T. McGrath, D. Crampton & J.B. Hutchings

1992 *A.S.P. Conf. Series*, 32, 386, "Searching for X-ray Binaries in the LMC: The Optical Counterparts of CAL 9 and CAL E", P.C. Schmidtke & A.P. Cowley, in *Complementary Approaches to Double and Multiple Star Research*, ed. H.A. McAlister & W.I. Hartkopf

1993 *Ap. J. Lett.*, 418, L63, "Detection, Identification, & Observed Properties of LMC Supersoft X-ray Sources", A.P. Cowley, P.C. Schmidtke, J.B. Hutchings, D. Crampton, & T.K. McGrath

1994 *Pub. A.S.P.*, submitted, "LMC Stellar X-ray Sources Observed with *ROSAT:* I. X-ray Data and Search for Optical Counterparts", P.C. Schmidtke, A.P. Cowley, L.M. Frattare, T.K. McGrath, J.B. Hutchings & D. Crampton

"X-ray Light Curve for an Eclipsing Black-Hole Binary"

This project was to follow the eclipsing X-ray binary CAL 87 through its eclipse in order to study the structure of the accretion disk. A series of observations were obtained with *ROSAT's* PSPC. The X-ray data show a short-duration, shallow eclipse which indicate an accretion-disk corona is being occulted. There is no indication of a temperature variation through the eclipse, as was expected from the optical data. The X-ray data also allowed an improved ephemeris to be derived. The results of this investigation have been published.

Publications Based on this Project

1992 *Bull.A.A.S.* **24**, 1154 "The X-ray Eclipse of the Black-Hole Binary CAL 87", P.C. Schmidtke, A.P. Cowley, T. McGrath & L. Frattare

1993 *Pub. A.S.P.*, **105**, 863, "The X-ray Eclipse of the LMC Binary CAL 87", P.C. Schmidtke, T.K. McGrath, A.P. Cowley & L.M. Frattare